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FLIGHT SONGS AND MATING SONGS.

BY ARETAS A. SAUNDERS.

SOME time ago, discussing the evolution of bird song (Auk XXXVI, pp. 149-151) I stated my belief that the mating songs of birds were more ancient in origin than ordinary songs, giving as an example the Eastern and Western Meadowlarks (*Sturnella magna* and *S. neglecta*). Later, Mr. Francis H. Allen, in an article on this subject (Auk XXXVI, pp. 528-536) discussed this case with some others, and gave some facts which seemed to him to prove that ordinary songs are more ancient than flight songs. Having given this subject a little more thought in the light of Mr. Allen's remarks, I have something more to add to the discussion.

Mr. Allen's conclusions appear to be entirely right. Such a flight song as that of the Ovenbird (*Seiurus aurocapillus*) does appear to be a more complicated development from the ordinary song. This seems to be true also of the flight songs of many other species, such as the Song Sparrow (*Melospiza melodia*), Maryland Yellow-throat (*Geothlypis trichas*), and McGillivray's Warbler (*Oporornis tolmiei*). But are these flight songs mating songs? A true mating song, if such a song distinct from the ordinary one is possessed by the species, should be confined to the season of courtship. In my experience the flight songs of these species are uttered most frequently late in the season, after the birds have chosen mates and begun nesting. It is true that I mentioned some of these songs in my letter as mating songs, but thinking the matter over I am doubtful of this. The flight songs of the Meadowlarks and the mating songs of the Robin (*Planesticus migratorius*) are confined to a very short season in April, when birds are choosing mates, and are very rarely sung at any other time. For this reason I believe they are true mating songs.

Mr. Allen mentions a song of the Black and White Warbler (*Mniotilta varia*) as an example of a mating song that is evidently a more complicated development of the ordinary song. At the time of reading his article I was not familiar with any such song. During the past summer I have paid more attention to the song of this species, and have heard several variations from the ordinary

type, some similar to, though not exactly like the song Mr. Allen describes. These variations however, were none of them heard until June and July after the species had been nesting for some time. The first one was noted on June 13. The nesting of this species begins in May in this region. In one case I found a bird of this species nest building at New Haven on May 10, a nest in which the last one of four eggs was laid May 20. This may have been a little earlier than normal time of nesting, but even so the mating song of this species, if it has one, should be sung mainly in the first half of May. I doubt, therefore, that the songs I heard were mating songs.

There seems to be a tendency on the part of a number of species to vary the song late in the season, too late for the variations to have any mating significance. I have noted such variations in the Yellow-throat, Field Sparrow (*Spizella pusilla*), Wood Thrush (*Hylocichla mustelina*), and others. The case of the Black and White Warbler I believe belongs with these, as does also that of the curious second song of the Blue-winged Warbler (*Vermivora pinus*). What significance there in these songs, is a problem to be worked out.

To take up the question of the Meadowlarks again, the flight song of the eastern species is certainly not a common one. The fact that it is almost entirely confined to a short season in the month of April makes it even less commonly observed. I agree with Mr. Allen that the ordinary song of this species is sometimes a mating song, as it is often sung on the wing, when in pursuit of a mate. It may be the fact that this song is useful as a mating song, that has caused many individuals to drop entirely the use of the more ancient type. Looking over my notes on this song, shortly after reading Mr. Allen's article, I could find no reference to the flight song of this species except in the month of April. I was about to conclude that it was entirely confined to this season, when a day or two later, on November 1, 1919, a bird favored me with the full flight song. This came in time to teach me that I could not make hard and fast rules about how and when a bird will sing. There seems every reason to believe, however, that this song is sung mainly in April and is a true mating song. My notes on it reveal another fact that may or may not be significant.

I have never heard this song sung except near the sea coast, by birds that breed in salt marshes. In fact I have heard it in only two localities, one at West Haven and the other at Norwalk. In these localities, however, it seems to be quite common in its season.

Concerning the flight song of the western species, it is more commonly heard than that of the eastern, at least in the state of Montana. Since little or nothing has been written about it and first-hand descriptions are better than those taken from memory, I submit the following description from my note book, dated at Helena, Montana, April 9, 1911. "The flight song differs from the ordinary one in quality, being less like the Oriole and more like the Bobolink. It begins with two or three clear low whistles, rendered from the perch before flight. After this introduction the bird rises into the air and starts a long-continued song very similar to that of the Bobolink. The first introductory notes sound like the call-note of the eastern Bluebird, though louder and somewhat lower in pitch." At the time this was written I had never heard the flight song of the eastern bird. I have, of course, never heard the flight songs of the two species where I could compare them, nor have I ever made accurate records of either one. My statement that they are much alike is based upon memory of the western song when comparing it with the eastern. As far as memory goes, except for the introductory notes, which are absent in the song of the eastern bird, the songs are practically identical.

If these songs are not ancient enough to go back to the time when the two species were one, and therefore more ancient than the ordinary songs, then the similarity between them is a most unusual coincidence. Having heard the flight songs of both species, I could be as easily convinced that the similarity in plumage of these two species is not ancestral, as that the similarity of their flight songs is not. Since the songs are evidently mating songs, and used almost exclusively in the mating season, the mating song in these species must have been the more primitive. It is true that these flight songs are longer and more erratic than the ordinary songs, as is the case with flight songs of most species; but they are also less pleasing or clearly musical in quality. This

is the contrary in such a flight singer as the Ovenbird. The ordinary song, therefore, even though shorter in duration than the flight song, is on a higher plane of song evolution, and, I believe, of more recent origin.

Concerning other flight songs, those of the Baltimore Oriole (*Icterus galbula*) and the Rose-breasted Grosbeak (*Zamelodia ludoviciana*) appear to be mating songs, and as Mr. Allen suggests, they appear to be elaborations of the ordinary song. They are probably evolved as he suggests, and are more recent in origin than the ordinary song. Those that I have mentioned above, that do not appear to be mating songs, because sung too late in the season, may possibly be steps in the adoption of a flight song by the species in question. That is, there are some species in which the flight song is the ordinary song, such as the Meadowlark, the Bobolink (*Dolichonyx oryzivorus*), the Longspurs, and Sprague's Pipit (*Anthus spraguei*). These birds are all ground nesters. In acquaintance with the singing habits of five of these species I might say that I have never known Sprague's Pipit to sing in any other manner than on the wing. McCown's Longspur (*Rhynchophanes mccowni*) sings from a perch only very rarely. The Chestnut-collared Longspur (*Calcarius ornatus*) sings from a perch more frequently than McCown's, but still rarely, while the Bobolink and Horned Lark sing from a perch about as frequently as on the wing. Now all these species sing so frequently on the wing that their flight song is in no sense a special mating song. Is it not possible that the other species, Ovenbird, Yellow-throat, Song Sparrow etc., birds that also nest on the ground, are slowly developing the flight song as an ordinary song? The true flight singers nest in open grass areas, in places where perches are hard to find. Those that have occasional flight songs nest in woods or thickets where perches may be had if desired. Perhaps the frequency of perches has kept the flight song from developing in these species as it has in the prairie birds. If in some future time, something should change the habitat of these species to more open regions, it is probable that true flight song would develop quickly.

48 Longview Ave., Fairfield, Conn.